

What is claimed is:

1. A method of transmitting routing information

comprising:

sending a first message containing a first sequence

5 identifier and a digest of routing information that has

been calculated using a first authentication key; and

subsequently sending a second message containing a
second sequence identifier that is earlier in a sequence

than the first sequence identifier and a digest of the

10 routing information that has been calculated using a second
authentication key.

2. The method of claim 1 wherein each authentication key

has a specified lifetime and the lifetime of the second key

15 expires prior to the lifetime of the first key.

3. The method of claim 1 wherein the first key is valid

only following an authentication key rollover and the

second key was valid at a time prior to the authentication

20 key rollover.

4. The method of claim 3 including:

determining whether neighboring routers have
successfully performed the authentication key rollover; and

sending both the first and second messages only if it is determined that at least one neighboring router has not yet successfully performed the authentication key rollover.

5 5. The method of claim 4 including sending only the first message if the first message forms part of a routing information advertisement that is the first such advertisement transmitted by the router after the authentication key rollover.

10

6. The method of claim 3 including sending only the first message if it is determined that all neighboring routers have successfully performed the authentication key rollover.

15

7. The method of claim 3 including:
receiving the first and second messages in a particular neighboring router; and
processing, in the particular neighboring router, only
20 the digest contained in the first message.

8. The method of claim 3 wherein the first sequence identifier comprises a number greater than the second sequence number.

9. A router comprising:

a port; and

a processor configured for sending a first message and

5 a second message over the port to a neighboring router, and

configured for sending the first message prior to the

second message,

wherein the first message contains a first sequence

identifier and a digest of routing information that has

10 been calculated using a first authentication key, and

wherein the second message contains a second sequence

identifier that is earlier in a sequence than the first

sequence identifier and a digest of the routing information

that has been calculated using a second authentication key.

15

10. The router of claim 9 wherein the processor is

configured for sending both the first and second messages

only if the router determines that fewer than all of its

neighboring routers have successfully performed an

20 authentication key rollover.

11. The router of claim 10 wherein the processor is

configured for using as the first key a key that is valid

only following the authentication key rollover and to use

as the second key a key that was valid at a time prior to
the authentication key rollover.

12. The router of claim 10 wherein the processor is
5 configured for sending only the first message if the first
message forms part of a routing information advertisement,
and the routing information advertisement is the first such
advertisement transmitted by the router after the
authentication key rollover.

10

13. The router of claim 10 wherein the first sequence
identifier comprises a number greater than the second
sequence number.

15 14. A computer system comprising:

a plurality of computer networks;
a first router interconnecting at least some of the
computer networks; and

neighboring routers coupled to the first router,
20 wherein the first router is configured for
periodically sending respective first and second messages
to one or more of the neighboring routers, and for sending
the first message prior to the second message,

wherein the first message contains a first sequence identifier and a digest of routing information that has been calculated using a first authentication key, and wherein the second message contains a second sequence identifier that is earlier in a sequence than the first sequence identifier and a digest of the routing information that has been calculated using a second authentication key.

5 15. The system of claim 14 wherein the first router is configured for sending both the first and second messages

10 only if the first router determines that fewer than all of the neighboring routers have successfully performed an authentication key rollover.

15 16. The system of claim 15 wherein each neighboring router that receives the first and second messages is configured for:

processing the first message using the first authentication key and discarding the second message without processing the routing information contained therein if that neighboring router has successfully performed the authentication key rollover, and

processing the second message using the second authentication key if that neighboring router has not successfully performed the authentication key rollover.

5 17. The system of claim 15 wherein the first router is configured for using as the first authentication key a key that is valid only following the authentication key rollover and for using as the second authentication key a key that was valid at a time prior to the authentication
10 key rollover.

18. The system of claim 15 wherein the first router is configured for sending only the first message if the first message forms part of a routing information advertisement
15 that is the first such advertisement transmitted by the first router after the authentication key rollover.

19. The system of claim 15 wherein the first sequence identifier comprises a number greater than the second sequence number.
20

20. An article comprising computer-readable medium storing computer-executable instructions for causing a router to:

send a first message containing a first sequence identifier and a digest of routing information that has been calculated using a first authentication key, subsequently send a second message containing a second sequence identifier that is earlier in a sequence than the first sequence identifier and a digest of the routing information that has been calculated using a second authentication key.

2
10 21. The article of claim 20 wherein the first key is valid only following an authentication key rollover and wherein the second key is valid at a time prior to the authentication key rollover.

15 22. The article of claim 21 including instructions for causing the router to:
determine whether neighboring routers have successfully performed the authentication key rollover, and send both the first and second messages only if it
20 determined that at least one neighboring router has not yet successfully performed the authentication key rollover.

23. The article of claim 22 including instructions for causing the router to send only the first message if the

first message forms part of a routing information advertisement that is the first such advertisement transmitted by the router after the authentication key rollover.

5

24. The article of claim 22 including instructions for causing the router to send only the first message if it is determined that all neighboring routers have successfully performed the authentication key rollover.

10

25. A method for use in connection with a router comprising:

receiving in the router a first message containing a first sequence identifier and a digest of routing information that has been calculated using a first authentication key;

15 subsequently receiving in the router a second message containing a second sequence identifier that is earlier in a sequence than the first sequence identifier and a digest 20 of the routing information that has been calculated using a second authentication key; and

processing the first message using the first authentication key and discarding the second message without processing routing information contained therein if

the router has successfully performed an authentication key rollover from the second key to the first key.

26. The method of claim 25 including processing the second
5 message using the second key only if the router has not
successfully performed the authentication key rollover.

27. A router comprising:

a port; and

10 a processor configured for:

receiving a first message containing a first sequence identifier and a digest of routing information that has been calculated using a first authentication key,

subsequently receiving a second message

15 containing a second sequence identifier that is earlier in a sequence than the first sequence identifier and a digest of the routing information that has been calculated using a second authentication key, and

processing the first message using the first key

20 and discarding the second message without processing routing information contained therein if the router has successfully performed an authentication key rollover from the second key to the first key.

28. The router of claim 27 wherein the processor is configured for processing the second message using the second key only if the router has not successfully performed the authentication key rollover.

5

29. An article comprising computer-readable medium storing computer-executable instructions for causing a router to:

receive a first message containing a first sequence identifier and a digest of routing information that has

10 been calculated using a first authentication key;

subsequently receive a second message containing a second sequence identifier that is earlier in a sequence than the first sequence identifier and a digest of the routing information that has been calculated using a second authentication key; and

process the first message using the first key and discard the second message without processing routing information contained therein if the router has successfully performed an authentication key rollover from

20 the second key to the first key.

30. The article of claim 29 including instructions for causing the router to process the second message using the

second key only if the router has not successfully
performed the authentication key rollover.

5

10

15

20